

[1296] As shown in FIG. 353, light guides can be layered 5064 to provide a variety of information to the images sensor 5062. Each layer can use different polarizations, orientations colors, etc. to provide a suite of spatially distinct information to the camera 5062.

[1297] FIGS. 354-355 show the operation of a tube restoring apparatus 5088 in accordance with an embodiment of the present disclosure. The apparatus 5088 includes a first end 5083 and a second end 5082 that squeeze a tube 5082 to ensure its round shape. The ends 5082, 5083 may be coupled to a back 5088. As a plunger 5085 compresses the tube 5082 (see FIG. 355), the plunger 5085 pushes the ends 5082, 5083 away from the tube 5082. When the plunger 5085 is retracted, a spring action causes the ends 5082, 5083 to restore the shape of the tube 5082.

[1298] FIGS. 356-357 show the operation of a tube restoring apparatus 5114 in accordance with an embodiment of the present disclosure. The apparatus 5114 includes a first end 5091 and a second end 5092 that squeeze a tube 5090 to help the tube 5090 maintain a round shape. The ends 5091, 5092 may be coupled to a common point 5089. As a plunger 5093 compresses the tube 5090 (see FIG. 357), the plunger 5093 pushes the ends 5091, 5092 away from the tube 5091. When the plunger 5093 is retracted, a spring action causes the ends 5091, 5092 to restore the shape of the tube 5090 as shown in FIG. 356.

[1299] FIG. 358 shows a circuit 7000 for storing data within an RFID tag 7008 associated with an infusion pump (e.g., the infusion pump 2990 of FIG. 255) in accordance with an embodiment of the present disclosure. The RFID tag 7009 of FIG. 358 may be the RFID tag 3670 of FIG. 325C. The antenna 7001 of FIG. 358 may be the antenna 3955 of FIG. 325C.

[1300] The antenna 7001 is coupled to an RFID tag 7008 such that an RFID reader (i.e., RFID interrogator) can communicate with the RFID tag 7008. The circuit 7000 may be placed on a 1x1 PCB inch board with a solid-metal ground plane of the back side.

[1301] An inner loop 7002 with a capacitor 7003 may form a split-ring resonator to enhance the read range capability of the circuit 7000. The RFID tag 7008 may be coupled to the antenna 7001 via an impedance matching network 7004, 7005, 7006, 7007. The circuit 7000 may be configured for use with a 900 Megahertz RFID reader.

[1302] A reader chip 7009 may interface with the RFID tag 7008 to write data (e.g., log data) thereto. The reader chip 7009 may communicate with the RFID tag 7008 using I2C, a CAN bus, or other communications link. Alternatively, 7009 may be an electrical connector, in some embodiments.

[1303] FIG. 359 shows an equivalent circuit 7010 for impedance as seen from the RFID tag 7008 of FIG. 358 in accordance with an embodiment of the present disclosure. A loop 7011 shows the antenna 7001 of FIG. 358. The inductor 7012 shows the inductor 7004 of FIG. 358. The resistors 7013 and 7014 are schematic representations of the resistors 7006 and 7005, respectively. The capacitor 7015 shows the capacitor 7007 of FIG. 359. The circuit elements 7012-7015 are used for impedance matching so that the RFID tag 7008 is efficiently coupled to the loop antenna 7001 such as in the circuit 7000 of FIG. 358.

[1304] FIG. 360 shows another circuit 7016 for storing data within an RFID tag 7022 associated with an infusion pump (e.g., the infusion pump 2990 of FIG. 255) in accordance with an embodiment of the present disclosure. The

antenna 7017 is shown. The RFID tag 7022 of FIG. 360 may be the RFID tag 3670 of FIG. 325C. The antenna 7017 of FIG. 360 may be the antenna 3955 of FIG. 325C.

[1305] The antenna 7017 may have capacitors coupled to the gaps in the antenna 7017, in some embodiments. An impedance matching network 7018, 7020, 7021 may be used to efficiently couple the RFID tag 7022 to the antenna 7017. An interface 7023 may be used to communicate with the RFID tag 7022 (e.g., an I2C interface, a CAN interface, etc.). FIG. 361 shows a split-ring resonator 7026 used with the circuit of FIG. 360 in accordance with an embodiment of the present disclosure. The split-ring resonator 7026 may be printed on a PCB board with an inner loop 7025 and an outer loop 7024. The split-ring resonator 7026 may be placed adjacent to the circuit 7016 of FIG. 260 to enhance its read range (e.g., the two planes defined by the two circuit's PCB boards may be parallel to each other).

[1306] Various alternatives and modifications can be devised by those skilled in the art without departing from the disclosure. Accordingly, the present disclosure is intended to embrace all such alternatives, modifications and variances. Additionally, while several embodiments of the present disclosure have been shown in the drawings and/or discussed herein, it is not intended that the disclosure be limited thereto, as it is intended that the disclosure be as broad in scope as the art will allow and that the specification be read likewise. Therefore, the above description should not be construed as limiting, but merely as exemplifications of particular embodiments. And, those skilled in the art will envision other modifications within the scope and spirit of the claims appended hereto. Other elements, steps, methods and techniques that are insubstantially different from those described above and/or in the appended claims are also intended to be within the scope of the disclosure.

[1307] The embodiments shown in the drawings are presented only to demonstrate certain examples of the disclosure. And, the drawings described are only illustrative and are non-limiting. In the drawings, for illustrative purposes, the size of some of the elements may be exaggerated and not drawn to a particular scale. Additionally, elements shown within the drawings that have the same numbers may be identical elements or may be similar elements, depending on the context.

[1308] Where the term "comprising" is used in the present description and claims, it does not exclude other elements or steps. Where an indefinite or definite article is used when referring to a singular noun, e.g., "a," "an," or "the," this includes a plural of that noun unless something otherwise is specifically stated. Hence, the term "comprising" should not be interpreted as being restricted to the items listed thereafter; it does not exclude other elements or steps, and so the scope of the expression "a device comprising items A and B" should not be limited to devices consisting only of components A and B. This expression signifies that, with respect to the present disclosure, the only relevant components of the device are A and B.

[1309] Furthermore, the terms "first," "second," "third," and the like, whether used in the description or in the claims, are provided for distinguishing between similar elements and not necessarily for describing a sequential or chronological order. It is to be understood that the terms so used are interchangeable under appropriate circumstances (unless clearly disclosed otherwise) and that the embodiments of the